STATUS OF THE CLAIMS

1. (Currently amended) A method for making a pattern of a metal containing material on a substrate, said method comprising:

(a) applying a mesomorphous film of a metal complex on a surface of the substrate;

(b) exposing, in a first atmosphere, a first area, having a first shape, of said film to electromagnetic radiation from a first source to cause said metal complex in said first area to undergo a first photo-chemical reaction, said first photochemical reaction transforming said metal complex in said first area into a first metal containing material adherent to said substrate and one or more ligand byproducts of a first kind at least some proportion of which are driven off during the course of said first photochemical reaction, wherein the pattern comprises said first shape; and ~~optionally~~

(c) driving off an unreacted amount of said metal complex and, where present, a remainder of said one or more ligand byproducts of a first kind that are not driven off during the course of said first photochemical reaction.

2. (Currently amended) The method of claim 1 further comprising:

after said ~~applying~~ exposing, and before said driving off,

(d) exposing, in a second atmosphere, a second area, having a second shape, of said film to electromagnetic radiation from a second source to cause said metal complex in said second area to undergo a second photo-chemical reaction, said second photochemical reaction transforming said metal complex in said second area into a second metal containing material adherent to said substrate and one or more ligand byproducts of a second kind at least some proportion of which are driven off during the course of said second photochemical reaction, wherein the pattern additionally comprises said second shape; and

(e) driving off, where present, ~~an unreacted amount of said metal complex and~~ a remainder of said one or more ligand byproducts of a second kind that are not driven off during the course of said second photochemical reaction.

3. (Original) The method of claim 2 wherein said first area is adjacent to said second area and said first and second metal containing materials form a planar structure on said substrate.

4. (Previously presented) The method of claim 2 wherein said steps of exposing said first and second areas of said film to electromagnetic radiation from said first and second sources respectively, comprise aligning first and second masks over said substrate and illuminating a surface of said first mask away from said substrate with said electromagnetic radiation from a first source, and illuminating a surface of said second mask away from said substrate with said electromagnetic radiation from a second source.

5. (Previously presented) The method of claim 2 wherein at least one of said electromagnetic radiation from a first source, and said electromagnetic radiation from a second source comprises ultraviolet light.

6. (Original) The method of claim 2 wherein said first atmosphere comprises oxygen and said first metal containing material is a metal oxide.

7. (Original) The method of claim 1 wherein said first atmosphere comprises oxygen and said first metal containing material is a metal oxide.

8. (Original) The method of claim 7 wherein said first atmosphere is air.

9. (Previously presented) The method of claim 7 further comprising:

removing remaining metal complex from said substrate, after said exposing said first area of said film to said electromagnetic radiation from a first source.

10. (Original) The method of claim 7 further comprising the step of reacting said metal oxide with a suitable chemical in a suitable atmosphere to reduce said metal oxide to a metal adherent to said substrate.

11. (Previously presented) The method of claim 1 wherein a local temperature of said first metal containing material is maintained below an annealing temperature of said first metal containing material throughout said step of exposing said first area of said film to electromagnetic radiation from a first source.

12. (Original) The method of claim 11 wherein said local temperature is maintained below 320 °C.

13. (Previously presented) The method of claim 1 wherein said exposing said first area of said film to electromagnetic radiation comprises aligning a first mask over said substrate and illuminating a surface of said mask away from said substrate with said electromagnetic radiation from a first source.

14. (Previously presented) The method of claim 13 wherein said electromagnetic radiation from a first source comprises ultraviolet light.

15. (Previously presented) The method of claim 1 wherein said metal complex comprises one or more metal atoms bonded to one or more ligands, at least one of said one or more ligands is bonded to said metal complex by a chemical bond which is broken by the absorption of said electromagnetic radiation from a first source, and wherein said complex is unstable when said at least one ligand is removed.

16. (Original) The method of claim 15 wherein said at least one ligand comprises a carboxylate group.

17. (Original) The method of claim 15 wherein at least one of said ligands is selected from the group consisting of: oxalato; halogens; hydrogen; hydroxy; cyano; carbonyl, nitro; nitrito; nitrate; nitrosyl; ethylene; acetylenes; thiocyanato; isothiocyanato; aquo; azides; carbonato; amine; pyridinyl; and thiocarbonyl.

18. (Previously presented) The method of claim 15 wherein at least one of said ligands is selected from the group consisting of: alkoxy; alkyl; alkenyl; alkynyl; alicyclic; substituted alicyclic; alkyl bicyclic; phenyl; substituted phenyl; naphthyl, naphthylene; phenoxy; substituted phenoxy; carboxylate; substituted carboxylate; benzoate; substituted benzoate; and heterocyclic aromatic.

Claims 19–43 (Cancelled).

44. (Previously presented) The method of claim 18 wherein any of said ligands that comprises one or more aryl groups does not comprise more than 26 carbon atoms.

45. (Previously presented) The method of claim 18 wherein any of said ligands that does not comprise any aryl groups does not comprise more than 12 carbon atoms.

46. (Previously presented) The method of claim 45 wherein said at least one ligand has formula O_2CR wherein R is an organic group selected from the group consisting of alkyl, alkene and alkyne.

47. (Previously presented) The method of claim 46 wherein R is $(CH_2)_4CH_3$.

48. (Previously presented) The method of claim 17 wherein at least one of said ligands is a bidentate ligand selected from the group consisting of: β-diketonato, mono-thio-β-diketonato, dithiolene, salicyladehyde, benzalazine, ethane-1,2-dithiolato, ethane-1,2,-dioximate, and dithiocarboxylate.

49. (Previously presented) The method of claim 17 wherein at least one of said ligands comprises one or more linking moieties, selected from the group consisting of: azo, diazo, oxy, amino, vinylene, phenylene, substituted phenylene, oxime, carboxy, and imine.

50. (Previously presented) The method of claim 1 wherein said metal complex comprises two metal atoms bonded to one another.

51. (Previously presented) The method of claim 15 wherein at least one of said metal atoms is selected from the group consisting of: copper, nickel, platinum, palladium, ruthenium, rhenium, molybdenum, chromium, tungsten and iron.

52. (Previously presented) The method of claim 15 wherein at least one of said metal atoms is selected from the group consisting of: lead, mercury, tin, silicon and germanium.

53. (Previously presented) The method of claim 15 wherein at least one of said metal atoms is selected from the group consisting of: rhenium and ruthenium.

54. (Previously presented) The method of claim 15 wherein said absorption of said electromagnetic radiation from a first source places said metal complex in a ligand to metal

charge transfer excited state in which a metal to ligand bond in said metal complex is unstable.

55. (Previously presented) The method of claim 15 wherein said absorption of said electromagnetic radiation from a first source places said metal complex in a metal to ligand charge transfer excited state in which a metal to ligand bond in said metal complex is unstable.

56. (Previously presented) The method of claim 15 wherein said absorption of said electromagnetic radiation from a first source places said metal complex in a d–d excited state such that a metal to ligand bond in said complex is unstable.

57. (Previously presented) The method of claim 15 wherein said absorption of said electromagnetic radiation from a first source places said metal complex in an intramolecular charge transfer excited state such that a metal to ligand bond in said complex is unstable.

58. (Previously presented) The method of claim 15 wherein said absorption of said electromagnetic radiation from a first source places at least one of said ligands in a localized ligand excited state wherein a bond between said excited ligand and said metal complex is unstable.

59. (Previously presented) The method of claim 1 wherein said exposing of said film to said electromagnetic radiation from a first source places said metal complex in an intramolecular charge transfer excited state such that at least one of said at least one ligands is unstable and decomposes.

60. (Previously presented) The method of claim 1 wherein said exposing of said film to said electromagnetic radiation from a first source places at least one of said ligands in a localized ligand excited state wherein said excited ligand is unstable and decomposes.

61. (Previously presented) The method of claim 1 wherein said exposing of said film to said electromagnetic radiation from a first source places said metal complex in a metal to ligand charge transfer excited state such that at least one of said at least one ligands is unstable and decomposes.

62. (Previously presented) The method of claim 1 wherein said exposing of said film to said electromagnetic radiation from a first source places said metal complex in a ligand to metal charge transfer excited state such that at least one of said at least one ligands is unstable and decomposes.

63. (Previously presented) The method of claim 1 additionally comprising repeating said applying, said exposing and said driving off for a second metal complex.

64. (Previously presented) The method of claim 63 wherein said second metal complex is applied on top of said first metal containing material.

65. (Previously presented) The method of claim 63 wherein said second metal complex is applied directly to said substrate.

66. (Currently amended) A method for making patterned metal containing material on a substrate, said method comprising:

(a) applying a mesomorphous film of a metal complex on a surface of the substrate;

(b) exposing, in a first atmosphere, a first area, having a first shape, of said film to a particle beam to cause said metal complex in said first area to undergo a transformation into a first metal-containing material adherent to said substrate and one or more ligand byproducts of a first kind at least some proportion of which are driven off during the course of said transformation;

(c) ~~optionally~~ driving off ~~an unreacted amount of said metal complex and~~, where present, a remainder of said one or more ligand byproducts of a first kind that are not driven off during the course of said transformation;

(d) exposing, in a second atmosphere, a second area of said film, having a second shape, adjacent to said first area, to electromagnetic radiation of a wavelength suitable to cause said metal complex in said second area to undergo a photo-chemical reaction, said reaction transforming said metal complex in said second area into a second metal containing material adherent to said substrate and one or more ligand byproducts of a second kind at least some proportion of which are driven off during the course of said photochemical reaction; and ~~optionally~~

(e) driving off an unreacted amount of said metal complex and, where present, a remainder of said one or more ligand byproducts of a second kind that are not driven off during the course of said photochemical reaction.

67. (Previously presented) The method of claim 66 wherein said particle beam is selected from a group consisting of an electron beam and an ion beam.

68. (Withdrawn) A thin mesomorphous film on a substrate, wherein the film comprises a photoreactive precursor metal complex.